

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 12 MAY 2006

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Applicant's or agent's file reference 4857PTWO/AG/la	FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/EP2005/050815	International filing date (day/month/year) 25.02.2005	Priority date (day/month/year) 27.02.2004	
International Patent Classification (IPC) or national classification and IPC INV. C01B25/34 A61L27/00 A61L31/12 A61F2/28			
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1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☐ sent to the applicant and to the International Bureau a total of sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- ☒ Box No. I Basis of the report
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 23.12.2005	Date of completion of this report 11.05.2006
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Werner, H Telephone No. +49 89 2399-8571



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2005/050815

Box No. I Basis of the report

1. With regard to the **language**, this report is based on

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-14 as originally filed

Claims, Numbers

1-28 as originally filed

Drawings, Sheets

1/6-6/6 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2005/050815

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-28
	No: Claims	
Inventive step (IS)	Yes: Claims	1-28
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-28
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

SECTION V

The present application claims a magnesium carbonate hydroxyapatite with a degree of carbonation of 4-10 wt% and with 5-15 mol% Mg with respect to Ca. Furthermore, composites comprising the magnesium carbonate hydroxyapatite and methods for making the magnesium carbonate hydroxyapatite and the composites are also claimed. The presently claimed hydroxyapatite has a high amount of Mg and therefore resembles natural bone.

The closest prior art is represented by US-B1-6 585 946. This document discloses a magnesium carbonate hydroxyapatite. The amounts of carbonate (up to 1 wt%) and Mg (up to 2 mol% with respect to Ca) are lower than in the present application. The method for producing the magnesium carbonate hydroxyapatite is different to the method claimed in the present application. There is no indication in this or any other document how to, starting from this document, increase the amount of both the Mg and the carbonate.

Further documents cited in the search report:

DATABASE WPI Section Ch, Week 200019 Derwent Publications Ltd., London, GB; Class D22, AN 2000-215957 XP002334917 & JP 2000 042095 discloses hydroxyapatite used as artificial bone. Magnesium carbonate hydroxyapatite is not disclosed.

BIGI A ET AL: "Magnesium and Strontium Interaction with Carbonate-Containing Hydroxyapatite in Aqueous Medium" JOURNAL OF INORGANIC BIOCHEMISTRY, ELSEVIER, vol. 15, 1981, pages 317-327, XP002306882 ISSN: 0162-0134 discloses magnesium interaction with carbonate hydroxyapatite. IR absorption analysis reveals that when magnesium substitutes calcium the carbonate disappears.

US-B1-6 569 489 discloses magnesium carbonate apatite. Hydroxyapatite is not disclosed.

There are no indications in the cited prior art to combine any of the cited documents to arrive at the solution claimed in the presented application. Therefore, these improvements could not have been predicted and justify inventivity.